

REMARKS

Favorable reconsideration of this application, in view of the present amendment and in light of the following discussion, is respectfully requested.

Claims 33-34, 37-42, 44 and 47-59 are pending, with claims 33, 42 and 51 amended and claims 58-59 added by the present application. Claims 33, 42 and 51 are independent.

In the Official Action, claim 42 was objected to; claims 42, 44, 47-50 and 55-57 were rejected under 35 U.S.C. § 112, first paragraph; claims 33-34, 37-41 and 51-54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Emerson (U.S. Patent Pub. No. 2003/0006418) in view of Vaudo (U.S. Patent No. 6,440,823); and claims 42, 44, 47-50 and 55-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Emerson in view of Vaudo and Tanizawa (U.S. Patent Pub. No. 2003/0205711).

Claim 42 is amended in response to the current objection thereof and in response to the current rejections under 35 U.S.C. § 112, first paragraph. Claims 33, 42 and 51 are amended, and claims 58-59 are added, to more clearly describe and distinctly claim Applicant's invention. Support for this amendment is found in Applicant's originally filed specification. No new matter was added.

Applicant submits that the current amendment does not raise a new issue requiring further search and/or consideration. Thus, Applicant respectfully requests entry of the current amendment under 37 C.F.R. § 1.116.

Briefly recapitulating, amended claim 33 is directed to:

A light emitting diode (LED), comprising:
a first gallium nitride layer having a first conductivity;
a super lattice structure including InGaN on the first gallium nitride layer,

wherein the super lattice structure is not doped with an n-type impurity,

wherein the super lattice structure includes a plurality of first InGaN layers and a plurality of second InGaN layers,

wherein each of the plurality of first InGaN layers has an In composition different from an In composition of each of the plurality of second InGaN layers, and

wherein one of the plurality of first InGaN layers or one of the plurality of second InGaN layers is directly on the first gallium nitride layer;

an active layer on the super lattice structure including InGaN; and

a second gallium nitride layer having a second conductivity on the active layer,

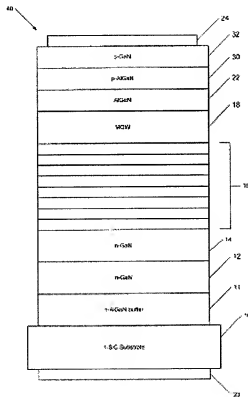
wherein the super lattice structure including InGaN has a plurality of pits formed thereon, and

wherein a non-zero number of the plurality of pits is 50 or less per area of $5\mu\text{m}\times 5\mu\text{m}$.

Amended independent claims 42 and 51 also recite a super lattice structure that is not doped with an n-type impurity. In Applicant's claimed invention, the super lattice structure is grown using an alkyl source including TMGa and TMIIn and a hydride gas including NH_3 and N_2 .¹ One skilled in the art knows that the use of Applicant's alkyl source while forming any structure will result in a structure that is not doped with an n-type impurity.

¹ Specification, page 6, lines 35-36.

Applied Fig. 1 of Emerson is reproduced below.



The applied structure of Emerson includes superlattice 16. However, Emerson teaches that superlattice 16 is doped with an n-type impurity such as silicon. (See Emerson, paragraph [0050]). However, Applicant's independent claims recite a super lattice structure that is not doped with an n-type impurity. Thus, Applicant submits that amended claims 33, 42 and 51 patentably define over Emerson. Similarly, new claims 58-59 patentably define over Emerson.

Applicant has considered Vaudo and Tanizawa and submits these references do not cure the deficiencies of Emerson. Indeed, it is not possible to cure the deficiencies of Emerson because Emerson explicitly teaches doping superlattice 16 with an n-type impurity, and thus teaches away from Applicant's claimed invention.

As none of the cited art, individually or in combination, disclose or suggest at least the above-noted features of independent claims 33, 42 and 51, Applicant submits the inventions

defined by claims 33, 42 and 51, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.

MPEP 2141 notes that prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. MPEP 2141 further notes that the prior art reference (or references when combined) need not teach or suggest all the claim limitations. However, an obviousness-type rejection must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. MPEP 2141 goes on to list exemplary rationales that may support a conclusion of obviousness. However, Applicant submits that the Official Action and the applied references present no objective evidence that would support an obviousness-type rejection of Applicant's amended claims based on one of these exemplary rationales.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael E. Monaco, Reg. No. 52,041, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§ 1.16 or 1.147; particularly, extension of time fees.

Dated: DEC 27 2010

Respectfully submitted,

By 

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